

RESEARCH INTERESTS	<ul style="list-style-type: none"> <li>• Neuroprosthesis for dynamic control of aspiration, design and clinical implementation</li> <li>• Neuroprosthesis design and implementation, particularly nerve electrodes, for restoration of function in SCI and Stroke patients</li> <li>• Biomimetic, integrated neural interfaces, utilizing nano- and micro- fabricated systems</li> </ul>	
EDUCATION	PhD, Biomedical Engineering, Case Western Reserve University, Cleveland, OH BS, Electrical Engineering, Michigan Technological University, Houghton, MI	1999 1992
ACADEMIC APPOINTMENTS	<b>Assistant Professor</b> , Dept. of Biomedical Engineering, Case Western Reserve University, Cleveland, OH  <b>Research Scientist</b> , Functional Electrical Stimulation Center of the Louis Stokes Department of Veteran Affairs Medical Center, Cleveland, Ohio <ul style="list-style-type: none"> <li>• Develop independent research program in neuroprostheses</li> <li>• Develop independent research program in biomimetic interfaces</li> <li>• Research and development of peripheral nerve electrodes in clinical neuroprostheses</li> <li>• Expertise in clinical and animal research</li> <li>• Expertise in regulatory and industrial aspects of translational research</li> <li>• Design controls for medical devices</li> </ul> <b>Adjunct Assistant Professor</b> , Dept. of Biomedical Engineering, Case Western Reserve University, Cleveland, OH  <b>Graduate Research Assistant</b> , Applied Neural Control Laboratory, Advisor: DM Durand, Case Western Reserve University, Cleveland, OH <ul style="list-style-type: none"> <li>• Functionally Selective Peripheral Nerve Stimulation: Electrodes that Alter Peripheral Nerve Geometry</li> <li>• Training in animal handling and surgical technique, pattern recognition, artificial intelligence, numeric methods, computational neuroscience, adaptive control</li> <li>• Design, fabrication, and safety evaluation of neural implants</li> </ul>	2004 - Present  2002 - Present  2003 - 2004  1992-1999
INDUSTRIAL APPOINTMENTS	<b>Manager, Software Engineering</b> , NeuroControl Corporation, Cleveland, Ohio. Evaluated and implemented several life-cycle management processes, including Requirements Management, Version Management, and Error Tracking. <ul style="list-style-type: none"> <li>• Managed two employees and four on-site contract software developers</li> <li>• Manage software and firmware development for all medical devices in the company</li> <li>• Principle Investigator of clinical research for dynamic closure of the vocal folds for prevention of post-stroke aspiration</li> </ul> <b>Biomedical Engineer III, Research and Development</b> , NeuroControl Corporation, Cleveland, Ohio. <ul style="list-style-type: none"> <li>• Project leader for product development of software simplifying grasp programming</li> <li>• Principle Investigator of clinical research projects for application of functional electrical stimulation</li> <li>• Principle Investigator for pre-clinical research projects</li> </ul>	2001-2002  1998-2001

	<b>Founder, President</b> , Bear Software, LLC, Highland Heights, Ohio.	1997-present
	<b>PC Manager and Assistant Network Administrator</b> , Applied Neural Control Laboratory, Case Western Reserve University, Cleveland, Ohio.	1992-1996
PROFESSIONAL TRAINING	<ul style="list-style-type: none"> <li>Medical Device Software: A Practical Guide to Software Process Control and Documentation, Underwriters Laboratories, Northbrook, IL.</li> </ul>	2001
PROFESSIONAL MEMBERSHIPS	<ul style="list-style-type: none"> <li>American Association for Advancement of Science</li> <li>IEEE – Engineering in Medicine and Biology Society</li> <li>Tau Beta Pi</li> </ul>	2001-present 1993-present 1990-present
ACADEMIC HONORS AND AWARDS	<ul style="list-style-type: none"> <li>Whitaker Foundation Graduate Research Fellowship.</li> <li>Finalist in the Whitaker Foundation Student Paper Competition, 16<sup>th</sup> Annual IEEE-EMBS International Conference, Baltimore, MD.</li> <li>Winner of the Whitaker Foundation Student Paper Competition, 15<sup>th</sup> Annual IEEE-EMBS International Conference, San Diego, CA.</li> <li>National Science Foundation Graduate Student Fellowship.</li> <li>NIH Graduate Trainee Fellowship, Case Western Reserve University.</li> <li>Michigan Technological University Scholar Award.</li> <li>MTU Merit Award for campus leadership and service.</li> </ul>	1993-1998 1994 1993 1993 1992-1993 1988-1992 1992
SERVICE – PROFESSIONAL	<p><b>Reviewer for Professional Journals</b></p> <ul style="list-style-type: none"> <li>IEEE Transactions of Neural Engineering and Rehabilitation</li> <li>Journal of Rehabilitation Research and Development</li> </ul> <p><b>Reviewer for Research Proposals</b></p> <ul style="list-style-type: none"> <li>SSS5 – 10, Special Reviews 5, SBIR/STTR, 2002 to Present (NIH)</li> <li>MRS, Musculoskeletal Rehabilitation Sciences, <i>Invited Temporary Member</i> (NIH)</li> </ul>	
SERVICE – UNIVERSITY	<ul style="list-style-type: none"> <li>Co-chair of Neural Engineering and Rehabilitation Day, Case Western Reserve University.</li> <li>Co-organizer of the Neural Prosthesis Seminar Series, FESC, Case Western Reserve University.</li> <li>Conflict of Interest Administrator, Cleveland VA Medical Center.</li> <li>Founding editor of the “BioPotential,” monthly newsletter of the Biomedical Engineering Graduate Student Association, Case Western Reserve University.</li> <li>Co-Chair, Biomedical Engineering Graduate Student Association, Case Western Reserve University.</li> <li>University Search Committee for Dean of College of Engineering, Michigan Technological University.</li> <li>Founding member and chairperson of the President’s Student Advisory Committee, Michigan Technological University.</li> <li>President, MI Beta Chapter of Tau Beta Pi, Michigan Technological University.</li> </ul>	2003-present 2003-present 2003-present 1994-1997 1993-1994 1991-1992 1991-1992 1990-1991
TEACHING EXPERIENCE	<ul style="list-style-type: none"> <li><b>EBME309 – Modeling Biomedical Systems</b>, 53 Students</li> <li><b>EBME359 – Modeling Biomedical Systems Lab</b>, 53 Students</li> </ul>	2004 2004

## RECENT FUNDING

### Pending

- Rehabilitation Engineering Platform Technology Center of Excellence, PI: Triolo, \$4,250,000. 2004-2009

### Current

- Dynamic Laryngotracheal Closure Using BION Technology, PI, VA Merit Review, \$441,400. 2004-2006
- Enhancing Neuroprosthesis Performance with Nerve Cuff Electrodes, Co-Investigator, \$1,128,525. 2003-2006
- Topography of the Nerves of the Tongue and Larynx for Neuroprostheses, PI, VA RIP Grant, \$10,000. 2003-2004
- Restoration of Hand and Arm Function by Functional Neuromuscular Stimulation, Co-Investigator, NIH Contract #N01-NS-1-2333.

### Past

- Stimulator to Prevent Aspiration, PI, SBIR #1 R43NS38776-01, \$100,000. 1999-2000

## RECENT REFEREED PUBLICATIONS

### Journal Articles

- **Tyler, DJ** and D. M. Durand (2003). "Chronic response of the rat sciatic nerve to the flat interface nerve electrode." Ann Biomed Eng **31**(6): 633-42.
- **Tyler, DJ** and DM Durand, "Functionally Selective Peripheral Nerve Stimulation with A Flat Interface Nerve Electrode," IEEE Transactions on Neural Systems and Rehabilitation Engineering, 10(4), 294-303, 2002.
- Broniatowski, M., S. Grundfest-Broniatowski, **D. Tyler**, et al. (2001). "Dynamic laryngotracheal closure for aspiration: a preliminary report." Laryngoscope 111(11 Pt 1): 2032-40.
- Qi, H, **DJ Tyler**, and DM Durand, "Neurofuzzy adaptive controlling of selective stimulation for FES: a case study," IEEE Transactions of Rehabilitation Engineering, 7(2), 183-192, 1999.
- **Tyler, DJ** and DM Durand, "A Slowly Penetrating Interfascicular Nerve Electrode for Selective Activation of Peripheral Nerve Axons," IEEE Transactions of Rehabilitation Engineering, 5(1), 51-61, 1997.
- **Tyler, DJ** and DM Durand, "Interfascicular Electrical Stimulation For Selective Activation of Surface and Deep Axon Populations," IEEE Engineering in Medicine and Biology Magazine, 13(4), pp. 575-583, 1994.

## PATENTS

### Granted

- **Tyler, DJ** and DM Durand, "Corrugated Nerve Electrode," *U. S. Patent No. 5,634,46.* 3 June 1997
- Durand, DM and **DJ Tyler**, "Slowly Penetrating Interfascicular Nerve Electrode," *U.S. Patent No. 5,400,784.* 28 Mar 1995
- **Tyler, DJ** and DM Durand, "Flat Interface Nerve Electrode and A Method for Use," *U.S. Patent No. 6,456,866.* 23 Sept 2002
- Fang, ZP, G Thrope, A Ignagni, S Pourmehdi, **D Tyler**, R Strother, M Walker, T Winter, J Demchak, J Mrva, A Spzak, "System and Methods for Performing Prosthetic or Therapeutic Neuromuscular Stimulation Using a Programmable Universal External Controller Using an External, Battery Powered Controller with Power Conservation Features," *U.S. Patent No. 6,587,728.* 1 July 2003
- Fang, ZP, G Thrope, A Ignagni, S Pourmehdi, **D Tyler**, R Strother, M Walker, T Winter, J Demchak, J Mrva, A Spzak, "System and Methods for Performing Prosthetic or Therapeutic Neuromuscular Stimulation Using a Programmable Universal External Controller Providing Different Selectable Neuromuscular Stimulation Functions," *U.S. Patent No. 6,625,494.* 23 Sept 2003
- Fang, ZP, G Thrope, A Ignagni, S Pourmehdi, **D Tyler**, R Strother, M Walker, T Winter, J Demchak, J Mrva, A Spzak, "System and Methods for Performing Prosthetic or Therapeutic Neuromuscular Stimulation Using a Programmable Universal External Controller Having a Graphical User Interface," *U.S. Patent No. 6,678,563 B2.* 13 Jan 2004
- Fang, ZP, G Thrope, A Ignagni, S Pourmehdi, **D Tyler**, R Strother, M Walker, T Winter, J Demchak, J Mrva, A Spzak, "System and Methods for Performing Prosthetic or Therapeutic Neuromuscular Stimulation Using a Programmable Universal External Controller Accommodating Different Control Inputs and/or Different Control Outputs," *U.S. Patent No. 6,701,189.* 2 March 2004

### INVITED SEMINAR PRESENTATIONS

- **Tyler, D. J.** , "New Strategies for Treatment of Dysphagia after Stroke," Scientific Basis of Neurorehabilitation for Spinal Cord Injury and Stroke, American Society of Neurorehabilitation, Cleveland, OH. 9 Aug 2003

### ABSTRACTS AND PRESENTATIONS

- Michael Broniatowski, MD, FACS, Sharon Grundfest-Broniatowski, MD, FACS, **Dustin J Tyler, PhD**, Harvey M Tucker, MD, FACS, Sheryl Brodsky, MA-CCCP/SLP, "A Human Laryngeal Pacemaker: Dynamic Laryngotracheal Closure for the Control of Aspiration," 7th International Workshop on Voice Surgery and Voice Care. Paris, France. 2002
- **Tyler, DJ**, Broniatowski, M, Grundfest-Broniatowski, S, Brodsky, S, "Recurrent Laryngeal Nerve Stimulation To Reduce Aspiration: Demonstration Of Clinical Feasibility," IFESS Meeting, Cleveland, OH. 2001
- Broniatowski, M, Grundfest-Broniatowski, S, **Tyler, DJ**, Tucker, HM, Scolieri, P, Brodsky, S, "Clinical use of an implanted pacemaker for aspiration. A Preliminary Report," 104<sup>th</sup> Annual Meeting of the American Laryngological, Rhinological, and Otological Society, Palm Desert, CA. 2001
- **Tyler, DJ** and DM Durand, "Small, Asymmetric Force Applied to a Peripheral Nerve: Chronic Effects of Nerve Reshaping Electrodes," *Annals of Biomedical Engineering*, 26 (S1), S-132. 1998
- **Tyler, DJ** and DM Durand, "Alteration of Nerve Geometry for Selective

- Stimulation," Proc. of IEEE-EMBS 19<sup>th</sup> Int'l Conference, Chicago, IL, USA. 1997
- Qi, H, **DJ Tyler**, and DM Durand, "NeuroFuzzy Adaptive Control of Selective Stimulation: A Case Study," 2<sup>nd</sup> International Functional Electrical Stimulation Society Conference, Vancouver, Canada. 1997
  - **Tyler, DJ** and DM Durand, "Functional Peripheral Nerve Recruitment from a Flat Interface Nerve Electrode," 1<sup>st</sup> International Functional Electrical Stimulation Society Conference, Cleveland, Ohio. 1996
  - **Tyler, DJ** and DM Durand, "Selective Stimulation with a Chronic Slowly Penetration Interfascicular Nerve Electrode," Proc. of IEEE-EMBS 18<sup>th</sup> Int'l Conference, Amsterdam, Netherlands. 1996
  - **Tyler, DJ** and DM Durand, "Electrodes that Alter Peripheral Nerve Geometry to Enhance Functional Selectivity of Peripheral Nerve Stimulation," Biomedical Engineering Research Day, Case Western Reserve University. 1996
  - **Tyler, DJ** and DM Durand, "Combined Modulation of Pulse Width and Pulse Amplitude to Enhance Functional Selectivity of Neural Stimulation," Proc. of IEEE-EMBS 17<sup>th</sup> Int'l Conference, Montreal, Quebec, Canada. 1995
  - **Tyler, DJ** and DM Durand, "Selective Activation of Fasciculated Peripheral Nerves by an Interfascicular Electrode," Engineering Foundation Conference on Neural Prostheses, Motor Systems IV, Mt. Sterling, Ohio. 1994
  - **Tyler, DJ** and DM Durand, "A Method of Quantifying Electrode Performance Based on Non-Invasive Three dimensional Isometric Torque Data," Proc. of IEEE-EMBS 16<sup>th</sup> Int'l Conference, Baltimore, MD. 1994
  - **Tyler, DJ** and DM Durand, "Design and Acute Tests of a Slowly Penetrating Interfascicular Nerve Electrode," Biomedical Engineering Research Day, Case Western Reserve University. 1994
  - **Tyler, DJ** and DM Durand, "Design and Acute Test of a Radially Penetrating Interfascicular Nerve Electrode," Proc. of IEEE-EMBS 15<sup>th</sup> Int'l Conference, San Diego, CA. 1993